

CLAIMS

What is claimed is:

1. A method for processing a workpiece in a workpiece processing apparatus comprising the steps of:

grasping a first workpiece between first and second rotatable catch mechanisms on a first side of a workpiece handling end-effector;

positioning the first workpiece in alignment with the workpiece processing apparatus;

rotating the first and second rotatable catch mechanisms to an open position to ungrasp the first workpiece and to raise the first workpiece into contact with the workpiece processing apparatus;

processing the first workpiece in the workpiece processing apparatus;

while processing the first workpiece, grasping a second workpiece between the first and second rotatable catch mechanisms on the first side of the workpiece handling end-effector;

positioning the workpiece end-effector below the workpiece processing apparatus with a second side of the workpiece end-effector aligned with the workpiece processing apparatus and with third and fourth rotatable catch mechanisms on the second side of the workpiece end-effector rotated to an open position;

transferring the first workpiece to the second side of the workpiece end-effector and rotating the third and fourth rotatable catch mechanisms to a closed position to grasp the first workpiece;

rotating the workpiece end-effector by 180° to align the second workpiece with the workpiece processing apparatus; and

rotating the first and second rotatable catch mechanisms to an open position to ungrasp the second workpiece and to raise the second workpiece into contact with the workpiece processing apparatus.

2. The method of claim 1 wherein the step of processing the first workpiece comprises the step of chemical mechanical planarizing the first workpiece.

3. The method of claim 1 further comprising the step of centering the first workpiece on the workpiece end-effector between rotatable rocker assemblies after the step of rotating the first and second rotatable catch mechanisms.

4. The method of claim 3 further comprising the step of contacting the workpiece processing apparatus with the rotatable rocker assemblies to cause rotation of the rotatable rocker assemblies.
5. An end-effector for gripping a semiconductor wafer at its edge, comprising:
 - an elongated gripping assembly having a first end adapted for attachment to a controllable robot, and a second end opposite the first end;
 - a first actuated wafer edge clamping assembly proximate the first end of the gripping assembly, and moveable between an open position and a wafer clamp position;
 - a second actuated wafer edge clamping assembly proximate the second end of the gripping assembly, and moveable between an open position and a wafer clamp position; and
 - a wafer centering mechanism configured to position a semiconductor wafer when the first actuated wafer edge clamping assembly and the second actuated wafer edge clamping assembly are in the open position.
6. The end-effector of claim 5, further comprising an actuator system for simultaneously actuating the first and second wafer edge clamping devices.
7. The end-effector of claim 6, wherein:
 - the first wafer edge clamping assembly comprises a first pivotable catch mechanism configured to rotate about a first axis coupled to the first end of the gripping assembly; and
 - the second wafer edge clamping assembly comprises a second pivotable catch mechanism configured to rotate about a second axis coupled to the second end of the gripping assembly.
8. The end-effector of claim 7, wherein the actuator system for simultaneously actuating the first and second wafer edge clamping devices comprises a rod connected to each of the first and second pivotable catch mechanisms.